CHARGE NUMBER: 0307
PROJECT TITLE: Measurements Development
PROJECT LEADER: C. L. Irving
PERIOD COVERED: February, 1983
DATE OF REPORT: March 9, 1983

I. Loose Ends Measurement

Objective: To develop a dynamic sensor and/or laboratory instrument for measuring loose ends and determine the effect of particle size, particle mixing, blend formula, tobacco weight, and OV on cigarette loose ends.

Status: A test was completed to evaluate the viability of using the Borgwaldt Cigarette Ends Tester or PM Loose Ends Tester for measuring cigarette loose ends as well as to determine the effect of DIET level, DIET shred size, tobacco weight, and processing OV on loose end generation. For the test, Cambridge type blends were made with 10, 20 and 30% normal production DIET, as well as, with 30% "gentle" tower DIET, 30% > 12 mesh DIET, and 30% <12 mesh DIET. Results of the study showed shred size and processing OV, which affects shred size, to be the major factors affecting loose ends. At constant shred size increasing tobacco weight reduced loose ends as expected. The test results gave no clear indication of the effect of DIET level on loose ends. The results showed however, that for DIET a trade off does exist between filling power and shred size and that for DIET the shred size is the major factor affecting loose ends not filling power.

The test results showed the Borgwaldt device to be fundamentally sound and to produce results that followed logical and expected patterns. The PM tester, with the conical probe, gave results which exhibited trends similar to the Borgwaldt but with some sensitivity to filling power. The approach used in the PM tester, however, does appear viable for quantifying loose ends dynamically.

Plans: A similar test will be repeated to verify the effects and interactions of shred size, OV, tobacco weight, and DIET level on loose ends. In addition, different size cones will be evaluated on the PM unit to reduce the sensitivity to tobacco filling power. Testing will also be done with typical production cigarettes to develop a baseline of data for comparison to experimental results.

II. Dynamic Firmness

Objective: To develop an instantaneous non-destructive technique for determining the firmness of cigarettes during making.

Status: A test was completed in the R&D Semiworks to evaluate the effect of tobacco temperature on the variability of dynamic firmness results. For the test, Marlboro filler was sent to the maker at 43, 77, and 88°F and subsequently exited the garniture at 60, 83, 90°F, respectively. Analysis of the data showed tobacco temperature to be a significant variable for accurately predicting compacimetric firmness from transducer data. Tobacco temperature caused ≈0.2 firmness units per°F offset in predicted firmness results.

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Plans: An Apple minicomputer with an Isaac interface was ordered to evaluate the entire dynamic firmness control concept (with dynamic moisture). Testing of this system will begin after the necessary interfacing hardware to move the ecreteur blade is obtained. In addition, a test will be run to evaluate the effect of tobacco shred size on the precision of dynamic firmness results.

III. Bulk Tobacco Filling Power

Objective: To develop instrumentation for more quickly determining the filling power of cut filler.

Status: Two tests of the four Borgwaldt CV testers were completed. The first test, using Marlboro and DIET tobaccos at three OV levels each, showed some indication of differences (probability level of 93%) between the original Borgwaldt CV tester and the three new units. After some mechanical adjustments the second test, with Marlboro, DIET, RL, and burley at three OV levels each, showed no evidence of instrument to instrument variation.

Plans: Make a recommendation to management on the use of the Borgwaldt CV tester as a replacement for the existing CV test.

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